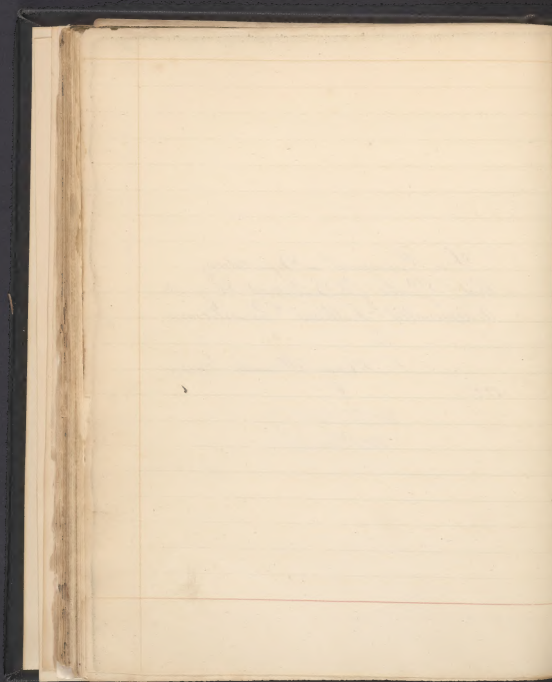


*An Inaugural Dissertation,
on that Species of Disordered Respiration,
denominated Asthma Concutivum.*

by
Henry Mordecai Tucker.

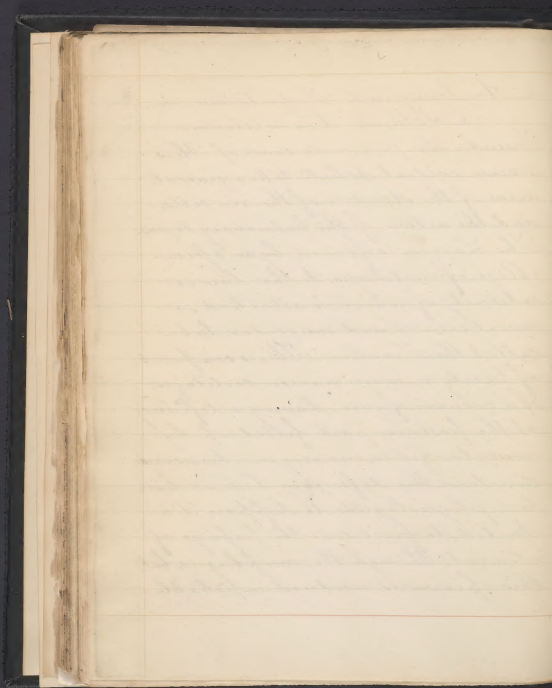
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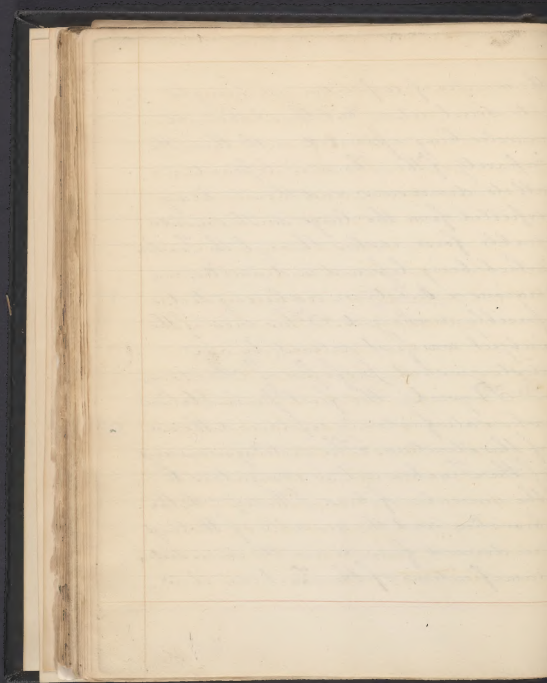


In Inaugural Dissertation, on
Asthma Convulsivum.

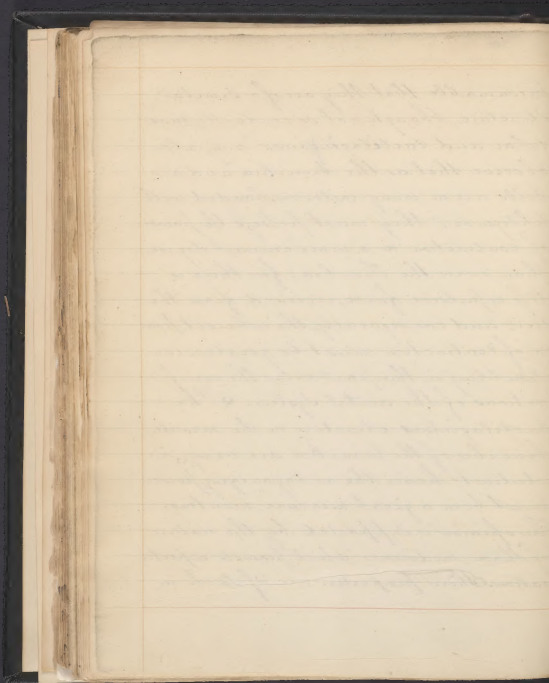
To render the proximate cause of this disease evident, I shall take a general view of the structure of the air cells, and the action of the pulmonary organs. The Larynx is formed by an assemblage of cartilages, to the lower extremity of which, is attached, a membranous and muscular tube, called the Trachea. This is composed of twenty or more narrow cartilages, of a circular figure, having a deficiency at the posterior part, filled up by muscular fibres, running in a transverse direction; this deficiency, behind have led physiologists to suppose it intended, to facilitate the passage of aliment, through the oesophagus, but this opinion is rendered improbable



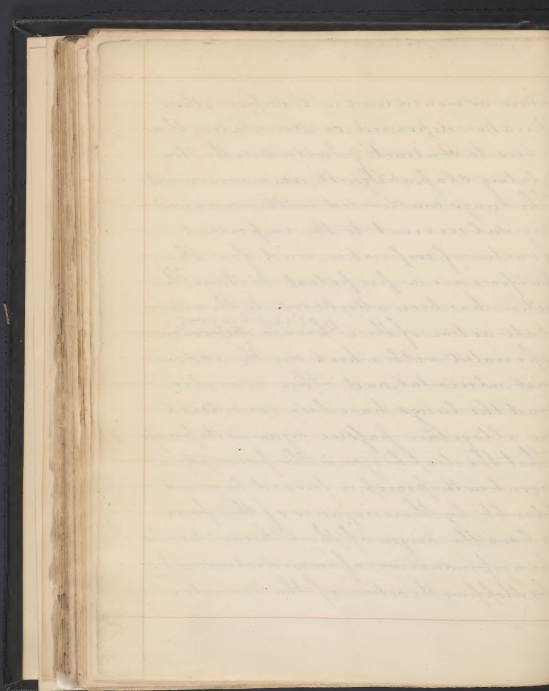
by the fact, that the oesophagus is not intimately connected, with the posterior part of the Trachea. In addition to this, it has been observed, that a similar arrangement exists, in the larger branches of the bronchia, which would not be necessary, if intended alone for this purpose; and nature has destined this for a more important function. In addition to this muscular structure, there is another no less evident, consisting of longitudinal fibres, occupying the interstices, between the cartilages. Now it is probable that these muscular fibres, are intended to lessen the dimensions of the tube, in order that collections of mucus, pus, and other extraneous matter may be expectorated with ease. That this arrangement facilitates expectoration cannot I think be doubted, for an exertion being made, not only



the muscles of respiration are brought into direct action, but the abdominal muscles being associated with them, the capacity of the Thorax is lessened, in all its dimensions; and the air being expelled from the lungs, with considerable force, rushes through the Trachea, which being lessened in diameter, any mucus or substance adhering to it, is forcibly discharged. This view of the subject was first delivered by our distinguished professor of Anatomy, Dr. Physick, the first person I believe who satisfactorily explained the use of this structure. The cartilaginous rings of the Trachea act as a constraint to the muscular fibres. (I Hunter). As the bronchia and the air cells of the lungs are derived from, or are the immediate ramifications of the Trachea, it is



presumable that they are of a similar structure, though not so evidently muscular and cartilaginous. I may also observe that as the bronchia and air cells are in many instances, loaded with phlegm; they must possess the power of contraction in a more eminent degree, than even the Trachea; for there is less expulsive force, received from the air; and consequently, the inherent power of contraction must be greater; resembling in this particular the ramifications of the arterial system. The cartilaginous structure in the minute bronchia of the bronchia are very indistinct; hence the antagonizing power must be in a great measure wanting. This opinion is supported by the nature of those medicines which promote expectoration. Their properties are of such a



nature, as would lead us to suppose, their
operation depended, on stimulating these
fibres to contract. [I allude to the Stim-
ulating Clasp, as Squills, ammonia &c.]
The lungs constructed in this manner
are subservient to the important
function of respiration, and for this
purpose are in perpetual motion. This
action has been attributed, to the alter-
nate action of the ^{Diaphragm} ~~Diaphragm~~ ^{Diaphragm}
associated with which are the abdomi-
nal, intercostal, and other muscles,
and the lungs have been considered
as altogether passive organs in the process.
That the diaphragm is the principal
agent in the process, is proved beyond
doubt, by those injuries of the Spine
above the origin of the Phrenic Nerves,
being productive of immediate death,
by stopping the action of this muscle.



Yet I consider the bronchia, and air cells
to assist in this process, in the following
manner. It has been ascertained by
Physiologists, that the oxygen of the atmosphere
is absorbed into the lungs, and
goes a change, combining with the carbon
evolved in the lungs, forming carbonic
acid gas; the heat imparted to this air by
the system, produces an expansion, this
distends the air cells of the lungs, the
muscular fibres of which, being stimulated
to contract, and the Diaphragm assisting
in the operation, the air is expelled; after
this the Diaphragm contracts, the air
cells return to their former dimensions,
which produces a vacuum; thus, the at-
mosphere air fills a second time, the
heat again imparted to this air, produces
again the stimulus of distention, and its
other effects. But in asthma, the muscular



fibres composing the air cells, cannot contract and dilate so readily, in consequence of the spasmodic constriction affecting them; and it is this, which produces the difficulty of breathing, and other distressing effects which characterize the complaint. That there is a vacuum in the cavity of the chest is rendered certain by a circumstance well known to surgeons, to wit, to those wounds of the chest, in which the cavity of the pleura is penetrated; in this case the lung on the injured side is collapsed, & unable to perform its function, being interrupted, by the air rushing through the wound, into the cavity of the pleura, & filling up the vacuum &c.

Having promised these general observations, I shall now proceed to the history of the disease under consideration. Nosological writers have divided



is taken into two species viz. The 'passive' and the 'tumour' or exfoliating, & to these two the last 'tetter' exact mode of development possibly similar, Professor Chapman has thought proper to reject this division as useless. Tetter has also been distinguished into Eczematous and Sympthomatic. It becomes fully evinces the breadth of this classification. The varieties may be divided into those acting immediately on the lungs, and such as affect the lungs secondarily. Under the former head may be arranged the fumes of certain metals as Arsenic &c. dust and the odour of certain substances, and Specac. &c. as also certain states of the atmosphere. Among the causes which secondarily affect the lungs, the most prominent are dyspepsia, and other



derangements of the Stomach & alimentary
canal. In such cases, the lungs are
sympathetically affected. Many other
causes have been supposed to produce
Asthma, as uterine irritation, &c. But there
is reason to believe, that the ~~first~~ produced
in this case is owing to derangement in the
Stomach. The intimate connection between
the Uterus and Stomach have been notice-
d by all writers on the subject. There
is scarcely a disease of the uterus, but indu-
ces derangement in the stomach. It is ~~by~~
~~no~~ not unusual, for hemorrhage from the
uterus to subside, upon vomiting coming
on spontaneously; yet it is generally ac-
knowledged, that emetics, instead of putting
a stop to the hemorrhage, decidedly,
augment it. I suppose strange that the
same effect, differently excited, should
produce such opposite results; but in the

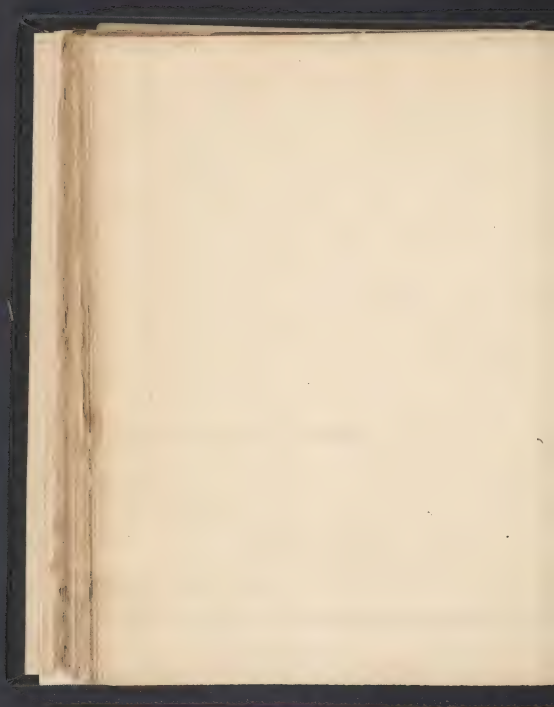
former instance, I presume that the stomach
is the principal agent, in the act of vomiting;
but when excited by emetic medicines, the
diaphragm, and abdominal muscles
are brought into violent action; which
by pressing on the blood vessels, determine
the blood to the uterus, & thereby aggra-
vate the mischief. The same reasoning
may be applied to the exhibition of emetics
in pregnancy, which irritate and excite
the uterus into premature action. The
paroxysms of Asthma are most frequent
in warm weather; the reason of this is
very obvious; heat relaxes the surface,
and in that way weakens the digestive
organs; and also by debilitating the sys-
tem generally, by profuse perspiration.
Nothing so effectually invigorates the
digestive organs, as the cold bath: pro-
vided the system is in a "susceptible condition"



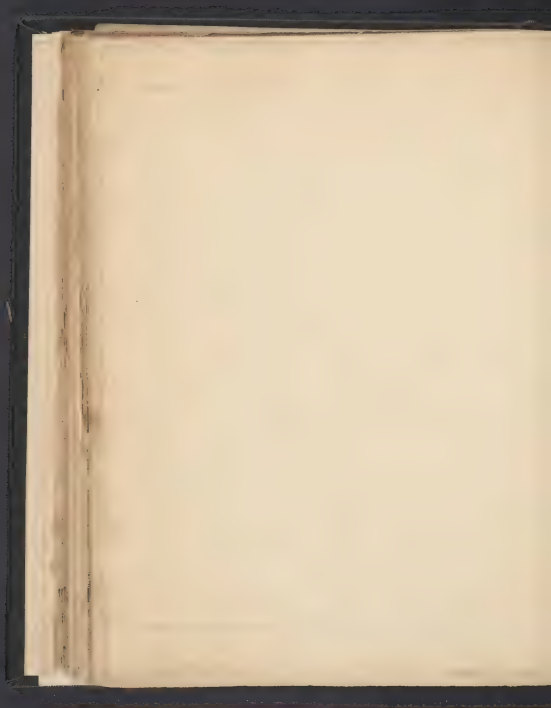
Certain districts of country, also predispose
to asthma, without any assignable cause.
Sudden changes from heat to cold, the re-
verse, repelled eruptions, metastasis of
gout, &c. The action of certain substances,
as *Spongia tonda*, form other cases of this
kind are on record. The paroxysm is
most frequent at midnight, particularly
after the first sleep. The cause, then, is not
very clear. May it not be owing to the
action of the ^{placenta} being more feeble at this pe-
riod than at any other time? or is proba-
bly the function of respiration is less active
at the time. The day. Analogy certainly
favours this opinion, as the arterial
and other animal functions are gene-
rally considered, as less vigorous at
night. Dr. Darwin attributes it to the
accumulation of stimuli during sleep.
We shall now proceed to describe the



phenomena observable in a paroxysm.
A day or two preceding the attack,
there are certain signs, denoting a
disorder of the primæ viæ. These are
a sense of distention, flatulency, eos-
tineus, and eructations; there is also
pain in the head. As evening approaches
a sense of tightness in the chest is
perceived, together with aggravation of
the other symptoms; a pain above the
eyebrows is a very common attendant; the
patient is irritable; as regards the appetite
there is, sometimes, a disposition and the
part of the patient to eat, and if indul-
ged uniformly hastens, and aggravates,
the approaching paroxysm. At this time
there is no very evident alteration of
the pulse; it is often quicker than natu-
ral. These are the symptoms preceding
the attack very generally; but in some



instances very few of these are observable. The patient retires, but about midnight he awakes, with considerable difficulty of breathing, attended with some hoarse voice, a sense of weight on the diaphragm, and stridors in the lungs; he immediately and as it were instinctively flies to the window for cool air; and in this difficulty of breathing is greatest, in the recumbent posture. He studiously avoids it. When the purpura is at its acme the skin in the neck is very distended, the countenance is generally suffused, but at other times is pallid and sunk, indicating considerable anxiety and distress. Considerable stupor, not unobscurely attended. The pulse is not a guide: Some times it is frequent, small, & quick; but at other times is not much affected. The urine during the purpura is pale; but after the



termination it is high coloured, and some-
times deposits a sediment. If relief be
not afforded, the ~~symptom~~ symptom, will continue
until morning, at which period, there
will be a remission of the ~~symptoms~~ symptoms; the
difficulty of breathing is lessened, partic-
ularly if expectoration is free; some diffi-
culty of breathing pain in the head
continues the next day, and all exertions
distress the patient, with difficulty of
breathing. The next evening, a second
paroxysm takes place; and in this way
the disease may continue for weeks, de-
bilitating the patient, if the proper
remedies, be not resorted to, & the remote
causes continue to act. These are the
phenomena, attending the most frequent
form; but another ~~variety~~ ^{form} of the
disease, not infrequently presents
itself: in this, the difficulty of breathing



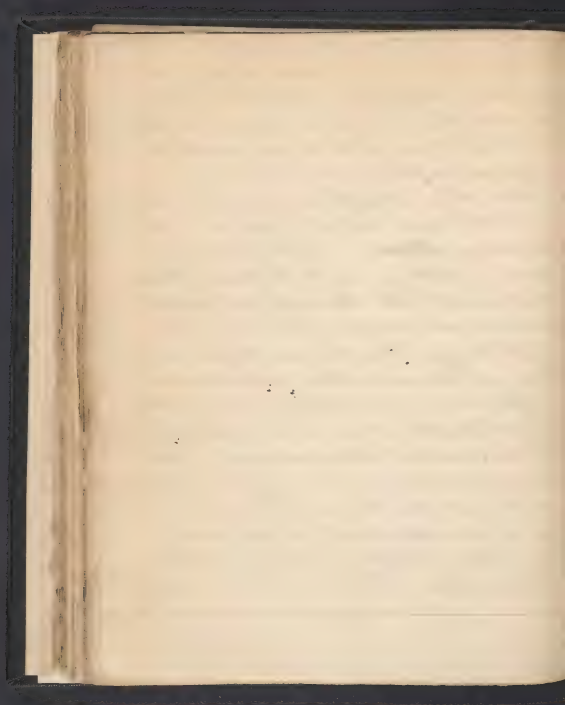
is very considerable; the wheezing is very
audible; the pain in the head is not so
great, as in the former case; the countenance
is pale, haggard, and anxious; the sur-
face is cold, and partial sweats, not
infrequently occur; the pulse is feeble;
partial diarrhoea ~~occurs~~ takes place,
the fear of dissolution is greater, and
edematous swellings occur. This is the
true disease acting upon a debilitated
and cachectic state of the system.
Dr. Keel and Ingenhousz writes as they
supposes ~~that~~ the mucous in the
lungs, which is expectorated after
the paroxysm to be a cause of the
disease; and although he adduces
analogical evidence to
support the opinion; yet he is cer-
tainly mistaken in this view: for in
the first place, the disease is never



succeeded by the discharge of mucus,
and the mucus is seldom expectorated
before the second, or third day after
the paroxysm; and in the second place,
if this was the cause of the disease, we
might at all times expect the discharge,
which is not the case; indeed the views
of Dr. Brown on this subject, have been
embraced by very ^{few} subsequent authors.
In the treatment of this disease, we
must keep in view the remote causes,
without which it is impossible to cure
the disease. To simplify this, I have
classified asthma according to the remote
causes, into three species. The first,
and by far the most frequent, cause
is irritation of the stomach, or that of
the abdominal viscera. The second
asthma is almost all instances, to be
a symptomatic disease, depending



on a disordered Stomach: this sometimes
brings the disease into action; & in all cases
predisposes to the attack; in the latter
case upon the application of some of the
other remote causes, the disease becomes
developed. I have frequently observed
that the action of a particular cause,
would occasion a paroxysm at one
time, and at other times, might be
borne with impunity. The second
Species, is where it is occasioned by
Aerial acrimony. Of this kind are a
corrupted atmosphere, localities caused
by which particular Affections, are
obnoxious to asthmatics, effluvia arising
from decaying articles; fumes from
cannas, and metallic fumes.—
The third division, comprehends
those depending on habit, or where
after the removal of the cause

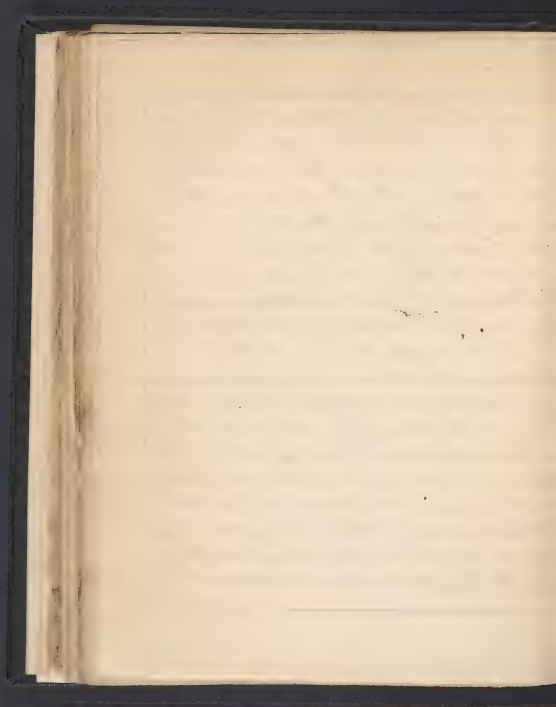


producing the disease, it still continues
to act: this not uncommonly occurs, and
it is to this form of the disease, an indisposi-
-tion, display so much power.

These three divisions correspond
with the three last divisions of the
ingenious Bree. The proximate
cause of Asthma is attributed by Cullen
and most of the other authors to a spas-
-modic constriction of the air cells
of the lungs. By Darwin the proximate
cause of this and other convulsive
affections is ascribed to violent exertions
of volition, to excessive pain - (Habitual Languor)
Exhaustment. In the treatment of this
complaint, the remedies may be consid-
-ered under two heads. Those which
are applicable during the paroxysm,
and those which are proper in the
intermissions. It would be a useful



considerable, ~~the same~~ venesection
is not really safe; but the relief afforded
is often very striking; from XII. ℥. to
XX. ℥. may be taken. Generally the dys-
pnea, pain in the head, and other
urgent symptoms, will subside, upon
the flowing of the blood; and not un-
frequently the transient effects will
be durable. Topical depletion may also
be resorted to; cups applied to the back.
Dr. Bice, who is opposed to blood
letting in this disease, recommends, when
it should be resorted to, that the blood
should be drawn from the vein at
intervals, and in small portions. This
practice may be suited to the disease
as it occurs in Europeans, but in this
country venesection is very generally
serviceable in the cases, marked
by the symptoms enumerated above.



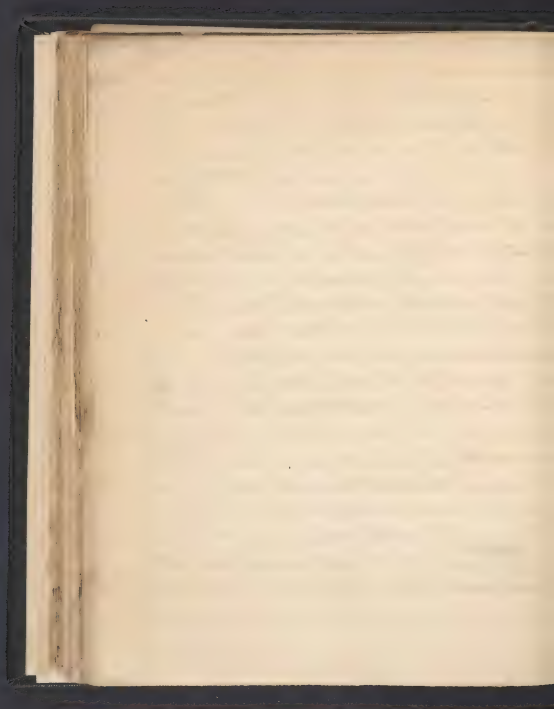
In addition to the relief afforded, the system is protected from Hydrothorax, Gonorrhoea, and other diseases which result from ill cured pneumonia inflammation.

The remedies next in importance, are Emetics. The majority of practitioners now recommend emetics: the best in these cases is Ipecacuanha. This was first ~~introduced~~ ^{introduced} into the practice of this disease by Atherside. This is adapted to almost all cases of the complaint; is equally suited to all stages. If exhibited previous to a paroxysm, particularly if brought on from excess in eating or drinking, which is frequently the case. If of the case will very often prevent the occurrence of the paroxysm; during a paroxysm the relief afforded is often very striking. Ipecacuanha acts in this case 1st by

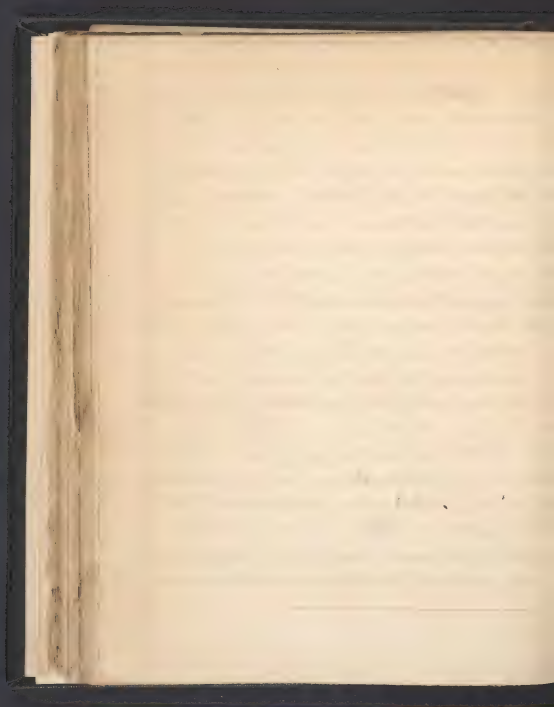


evacuating the contents of the Stomach.
2. By overcoming Spasm. 3. Determining
to the Surface, and by that means remov-
ing pulmonary congestion. 4th By in-
spiring Air to the Stomach. 5th It is
in the and ⁱⁿ other Spasmodic affections,
that the Sulphur Lini or white ointment
has been highly recommended as an Emetic.
If after bleeding & the exhibition of an
Emetic, the disease still continues, we
must examine further into the case; and
we will often find it to be kept up by
the morbid irritability of the bronchia
& air cells. To remove which antispasmod-
ics are the appropriate medicines. Of these
Opium in combination with camphor or
the last mentioned article by itself.

The camphor should be suspended in milk,
or ^{dissolved in} Spirits, according to circumstances; the
most proper latter in this case is generally



preferable. In ordinary cases gr. X will answer;
but when, as will sometimes happen, the
dyspnoea & whooping is very great, threat-
ening immediate suffocation; where the
restlessness of the patient is extreme, tossing
from side to side, when the action of the
pectoral, Diaphragm, & other muscles are
brought into action, with the view of
enlarging the cavity of the Thorax,
the countenance pale, & the pulse feeble;
in such cases it is of course suspended
in a wine glass full of brandy will af-
ford great relief by making a powerful
irritation on the Lungs. The only objec-
tion to the exhibition of spirit is the
drowsiness it occasions. In slight attacks
a dose of Sassafras will cure it off.
The Sulphur Ethor in combination
with Sassafras has been highly recom-
mended: the following is the formula.



R. Ther. Lich: ʒi
Fini: Thib: ʒtt xl.

Mist. haustus.

To the list of Antispasmodics, may
be added musk, castor, opafatida,
Hyoscyamus & others which have been
used occasionally with success, but not
sufficient to warrant my noticing them
particularly. Those above mentioned with
in general afford relief: provided the
remedies be properly adjusted to the
case. As a general rule, antispasmodics
are applicable to those cases ^{along} depending
upon habit — The halations in this
case must not be neglected: they
relieve spasm, & promote expectoration.
When used, the instrument invented by
Kedge should be employed. The va-
pour of water, or vinegar, after answers
very well. Balsam Tolu has also been



~~has~~ been used. The formula recommended by Dr. Physick in cases of Catarrh, mucosus, I think, be advantageously used in the present case. It consists of Hoffman's ^{liquor} Suedae, and Laurdanum, of each one drachm. ^{The vapor of which is} to be inhaled for half an hour or more. [Chapman's Theory.] The smoking of certain substances have been recommended to Cures & Rheumatism. These have been supposed use up, & occasionally injurious by Brece; But Professor Chapman, whose experience with the latter article has been great, has derived much advantage from the practice. The facitious gases so much in vogue at one time, do not at present excite much attention: They have been highly spoken of by Beddoes & Farrer -

This completes the treatment in the paroxysm. The intention now a purgative



should be given. The case, when the bowels
are costive, Calomel for many ~~times~~
reasons should be preferred; in some
cases must be repeated. As a general
rule purgatives should be discontinued
as soon as the fever assumes a natural
appearance. The cases requiring active
purgings are very rare; in general Laxatives
are used better. Rhubarb 5 grains before
each meal, is very excellent. Where acidity
prevails the Cal. Magnesia or Bicarbous
mixture; but in general it does well enough
better; particularly in those cases where
the hemorrhoidal discharge is suppressed.
I know a person, in whom the habitual
use of aloetic preparations produced
hemorrhoids, & from that period the
paroxysms have gradually declined.
Whether the effect is to be ascribed to
this or not, I am at a loss to determine.

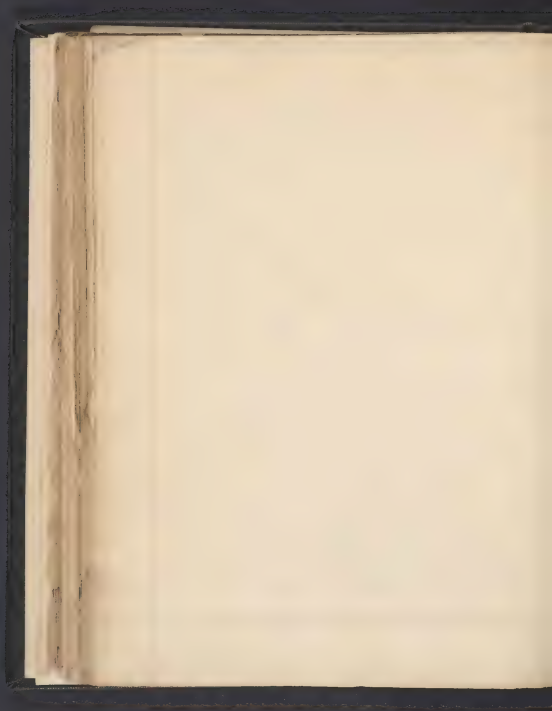


I am disposed to attribute the effect, now
to a very particular attention to regimen,
avoiding the exciting causes, together with
that change which usually takes place ^{in the system} at
the age of puberty. The fact is, certainly,
interesting, & on that account I thought
it worthy of notice. It might at first
view appear, that blisters, would prove
serviceable; but experience, has not, con-
firmed this opinion. In cases, however,
depending upon the effusion of water in
the cavity of the chest; perichthial
blisters, as an auxiliary measure, to
remove the effusion, may be resorted to
with advantage. The *Emet. Emet.*
plaster, may I think prove serviceable.
A plaster of the *Pis Burgundica* is
a very popular remedy, applied ei-
ther to the front or back part of the
Thorax.



The Digitalis has been much recommend-
ed by Dr. Syngue of Cork, an account
of which is given by Dr. Thomas.
The particular cases, to which the
Digitalis is suited, have not been
pointed out. I should suppose it
suited to those cases of the disease
complicated with effusions in the
chest, and general anasarca, in
debilitated subjects. The pepsin
acid has also been recommended
and the particulars may be seen in
the work published by the author.

Having by the proper application
of the above remedies, cured the com-
plaint, the patient will be still
subject to a return of the disease, upon
the application of the remote cause.
I expect, radical cure the patient
should select his residence in a



country which is suited to his particular constitution. No precise rules can be given on this Subject. In general, mountainous countries disagree with asthmatics. 2^d If dyspepsia exists, it should be removed as speedily as possible, & the State of his Lungs should be particularly attended to. The diet should be nourishing and light; his drinks of the mildest kind; he should take gentle exercise, his clothing should be warm.

If the patient be young, and of a good habit, it may be radically cured; but in the aged and infirm it often proves extremely troublesome; & a cure cannot in all cases be effected. The appearances on dissection are various. When



death has suddenly taken place, no
appearance of disease is visible; this
is indirect proof of the disease being
spasmodic; & the spasm relaxing
after death: in other cases, effusions
of serum in the Thorax; & not infrequently
by the cellular structure of the lungs
is filled with mucus. The stomach
and other of the abdominal viscera
are often found in a disordered state,

